

Claims

1. Method for extending the shelf life of perishable agricultural products and/or food, whereby the method includes the steps of filling the agricultural or food products into a packaging container (10), creating a modified atmosphere inside the packaging container (10) and sealing the packaging container (10), characterised in that the modified atmosphere is created in such a way, that it contains an increased concentration of oxygen compared to normal ambient air.
2. Method according claim 1, characterised by creating the modified atmosphere in such a way, that the concentration of oxygen in the modified atmosphere is between 40% and 90%, preferably between 60% and 85%, especially approximately 80%.
3. Method according to claim 1 or 2, characterised by creating the modified atmosphere in such a way, that it additionally contains an increased concentration of carbon dioxide compared to normal ambient air, whereby the carbon dioxide concentration is preferably between 2% and 25%, especially approximately 10%.
4. Method according to any one of claims 1 to 3, characterised by creating the modified atmosphere in such a way, that it further contains an increased concentration of ozone compared to normal ambient air, whereby the ozone concentration is between 1% and 17%, preferentially between 5% and 16%, especially between 10% and 15% in relation to the oxygen concentration in the modified atmosphere.
5. Method according to any one of claims 1 to 4, characterised by creating the modified atmosphere in such a way, that it further contains an elevated concentration of an inert gas, preferably a noble gas, compared to normal ambient air, whereby the concentration of the inert gas preferably is between 2% and 10%, especially approximately 8%.
6. Method according to any one of claims 1 to 5, characterised in that after sealing of the packaging container (10) it is irradiated with ultraviolet light in such a way, that ozone is created by the ultraviolet light due to the high concentration of oxygen inside the sealed packaging container (10).

7. Method according to claim 6, characterised in that the packaging container (10) is irradiated with ultraviolet light such, that the density of energy of the ultraviolet light impinging on the packaging container is between 2'000 mW sec cm⁻² (20 kJ m⁻²) and 10'000 mW sec cm⁻² (100 kJ m⁻²), whereby the ultraviolet light has a wavelength between approximately 160 nm and approximately 280 nm and preferably a intensity maximum at 185 nm and/or a intensity maximum at 254 nm.
8. Method for extending the shelf life of perishable agricultural products and/or food in a packaging container in particular according to any one of claims 1 to 7, characterised in that prior to be filled into the packaging container the agricultural or food products are washed with ozonic water.
9. Method according to claim 8, characterised in that the washing water has a ozone content between 2 and 20 mg/l, preferentially an ozone content between 4 and 10 mg/l, especially an ozone content between 6 and 8 mg/l.
10. Packaging container (10) with perishable agricultural products and/or food contained in the container, manufactured according to the method according any one of claims 1 to 9, whereby the agricultural or food products and a modified atmosphere are contained inside the sealed packaging container (10), characterised in that the modified atmosphere contains an increased concentration of oxygen compared to normal ambient air.
11. Packaging especially for the implementation of the method according to any one of claims 1 to 9, including a packaging container (10) made in such a way that it may contain perishable agricultural products and/or food and that a modified atmosphere may be created within the packaging space defined by the packaging container (10), the packaging container (10) being essentially hermetically sealable and being equipped with a gas passage device (30, 40, 50) for the release of gases out of the packaging space, said gases being produced by the metabolic residual respiration of the agricultural or food products contained in the packaging container (10), characterised in that the gas passage device (30, 40, 50) is constructed as a flat foil structure, which forms at least one section of the wall of the packaging container (10).
12. Packaging according claim 11, characterised in that the gas passage device (30, 40, 50) comprises a semi-permeable plastic foil (30), which is constructed

in such a way, that on it's entire surface the gas permeability for molecular oxygen is between $1'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($1.16 \cdot 10^{-8} \text{ m sec}^{-1}$) and $10'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($1.16 \cdot 10^{-7} \text{ m sec}^{-1}$), preferably between $3'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($3,5 \cdot 10^{-8} \text{ m sec}^{-1}$) and $6'400 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($7.4 \cdot 10^{-8} \text{ m sec}^{-1}$), and for carbon dioxide the gas permeability is between $3'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($3.5 \cdot 10^{-8} \text{ m sec}^{-1}$) and $30'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($3.5 \cdot 10^{-7} \text{ m sec}^{-1}$), preferably between $12'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($1.39 \cdot 10^{-7} \text{ m sec}^{-1}$) and $16'000 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$ ($1.86 \cdot 10^{-7} \text{ m sec}^{-1}$).

13. Packaging according claim 11 or 12, characterised in that the gas passage device (30, 40, 50) comprises a foil (30) made out of a minimum of two joined layers (32, 34) containing at least one pocket defining zone (40, 50) where the two foil layers (32, 34) are not joined and where a pressure sensitive sealing material (46, 56) is inserted between the two foil layers (32, 34), whereby in the pocket zone (40, 50) perforations (41, 42, 43, 44, 51, 52, 53, 54) are built in the two foil layers (32, 34) in such a way, that they are permeable for gases, but essentially not permeable for the sealing material (46, 56), thus creating a gas overpressure valve in the pocket zone (40, 50).
14. Packaging according to claim 13, characterised in that the pressure sensitive sealing material (46, 56) is a gel-like mass (46, 56).
15. Packaging according to claim 14, characterised in that the perforations (41, 42, 43, 44, 51, 52, 53, 54) are arranged at mutually displaced locations in both foil layers (32, 34).
16. Packaging according claim 14 or 15, characterised in that an anti-microbial substance is added and mixed to the gel-like mass (46, 56).
17. Packaging according any one of claims 14 to 16, characterised in that an ethylene binding substance is added and mixed to the gel-like mass (46,56).
18. Packaging according to any one of claims 11 to 17, characterised in that at least one section of the wall of the packaging container (10) is made in such a way, that this section the wall of the packaging container wall is highly transparent for ultraviolet light.
19. Packaging according to any one of claims 11 to 18, characterised in that the packaging container (10) is made in such a way, that it is suitable for cooking

the agricultural or food products contained in the sealed packaging container (10) in a micro-wave oven.

20. Packaging according to claim 19, characterised in that it further comprises a hydrogel mass arranged in the packaging container (10), said hydrogel mass releasing water when heated.
21. Packaging according to any one of claims 11 to 12, characterised in that it further comprises a drying agent arranged in the packaging container (10).